

**TITLE : An improved lumber positioning device  
on a carpentry cutting bench**

**BACKGROUND OF THE INVENTION**

The present invention relates to lumber cutting and more particularly to an improved lumber positioning device on a carpentry cutting bench which is a convenient and accurate non-step lumber positioning type device.

Prior art lumber cutting bench has a plurality of rows of positioning holes in a pinched board on the bottom and a pair of positioning rods spacedly pressed into a pair of selected positioning holes. These positioning rods is used in cooperation with a rip fence to clip the lumber for cutting. However, this type of lumber positioning device uses a pair of positioning rods insert into a pair of immovable positioning holes that could not adjust the space in between so as difficult to correspond with the sizes of the cutting lumber for a tightly gripping. Further, to select a pair of positioning holes to engage within the pair of positioning rods by measuring the distance with the eyes is not accurate. The carpenter must try again and again to find out a pair of exact positioning holes to dispose the pair of the positioning rods to succeed the gripping of a piece of lumber. This is a great disadvantage of the prior is lumber cutting bench.

**SUMMARY OF THE PRESENT INVENTION**

The present invention has a main object to provide an

improved lumber positioning device on a carpentry cutting bench which adopts non-step positioning structure for quickly and accurately gripping different sized lumbers for cutting that is convenient to a carpenter.

- 5        Accordingly, the improved lumber positioning device of the present invention comprises generally a pair of rip fences respectively secured to the lateral sides of a rectangular table. The rip fence each has a plurality of vertical slots of different oblique angles and corresponds with each other.
- 10      The table has a plurality of meter gauge slots in center surface matched with those vertical slots, at least a pair of straight guide grooves parallel formed beside the meter gauge slots and each having a rack on inner side for engaging with a pair of positioning plates each of which has a central hole for
- 15      respectively disposing a pair of positioning rods and a horizontal through holes, a pair of arcuate expanding pieces respectively engaged within two end of the horizontal through hole having teeth on their outer peripheries. The arcuate expanding pieces are restrained by at least an elastic ring.
- 20      The positioning rods each has a handle on the top and an elliptic protrusion eccentrically integrated at lower end and pressed into the positioning plates and the expanding pieces. When rotates the positioning rods for a certain angle, the expanding pieces move outward and their teeth engage with
- 25      the rack of the straight guide grooves such that the

positioning rods together with the rip fences clip a cutting  
lumber non-steppedly.

The present invention will become more fully understood  
by reference to the following detailed description thereof  
5 when read in conjunction with the attached drawings.

#### BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is an exploded perspective view of the preferred  
embodiment of the lumber positioning device of the present  
invention,

10 Figure 2 is a sectional view looking at one side of the  
present invention,

Figure 3 is a vertical sectional view of the positioning  
plate,

15 Figure 4 is a horizontal section view of the positioning  
plate,

Figure 5 is a plane view looking from the top of the present  
invention,

Figure 6 is a vertical sectional view to a positioning rod  
disposed into a positioning plate,

20 Figure 7 is a horizontal sectional view of Fig. 6,

Figure 8 is a top plane view of the positioning rod,

Figure 9 is a sectional view a lumber disposed between a  
positioning plate and a rip fence,

25 Figure 10 is a top sectional view to show that a positioning  
rod in a positioning plate before rotation,

Figure 11 is a to sectional view to show that the positioning rod is rotated,

Figure 12 is an elevational view to show a lumber that is already dipped by the positioning rod and rip fence, and

5 Figure 13 is a perspective view to show that a lumber is cutting by a hacksaw.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

With reference to Figs. 1 to 5 of the drawings, the improved lumber positioning device 10 of the present invention  
10 comprises a pair of symmetrical rip fences 20 and 30 respectively secured to opposing lateral edge of a rectangular board 40 by a plurality of screws 11, wherein the rip fence 20 is positioned uniform with the bottom of the rectangular board 40 and the rip fence 30 is positioned slightly lower  
15 than the bottom of the board 40 so that the lower edge of the rip fence 30 may lean on an edge of a working table 60 or engage with a longitudinal groove of the working table 60 (as shown in Fig. 13). The rip fences 20 and 30 each has a plurality of oblique vertical slots 21 and 31 of different  
20 angles corresponding with one another. The board 40 has four through holes 41 in horseshoe shaped grooves for securing the lumber positioning device 10 on the working table 60 of a cutting bench by screws 411, a pair of parallel transverse guide grooves 42 and several oblique cutting grooves 46 in  
25 the central surface respectively communicating with the

oblique vertical slot 21 and 31. The transverse guide grooves 42 each has rack 421 on an inner wall and a protrudent bar 422 on the bottom for slidably disposing a positioning plate 43 each of which has four projections 431 on four corners of the upper surface, a vertical through hole 432 in the center, a pair of horizontal recesses 433 in the opposing lateral sides and a pair of indentations 434 in the opposing edges of the bottom slidably engaged with the protrudent bar 422. A pair of symmetrical expanding plates 44 respectively disposes into the pair of horizontal recesses 433 of the positioning plate 43, each has teeth on outer edge engageable with the rack 421 of the guide grooves 42, a semi-circular inner edge 442 which may be combined into a circular hole after bound up by a pair of elastic rings 444 which provide the resilience force to the expanding plates 44. A rectangular plate 435 disposes under the protrudent bar 422 and connected with the bottom of the positioning plate 43 for preventing the positioning plate 43 from disengaged with the protrudent bar 422. A positioning rod 45 for each of the positioning plate 43 and each has a lateral handle 451 on the top and an elliptic protrusion 452 having an oblique distal position eccentrically integrated with the lower end inserted into the central hole 432 of the positioning plate 43 and the arcuate inner edges 442 of the expanding plates 44.

Referring to Figs. 6, 7 and 8, due to the diameter of the

protrusion 452 is larger then that of the expanding plates 44, the expanding plates 44 are expansible outward from the positioning plate 43 and its teeth engage with the rack 421 of the guide groove 42. So that the positioning plate 43 is immovable. If a piece of lumber 50 to be cut on the board 40, put it on the board and remove the positioning rod to permit the positioning plate 43 moving feely in the guide groove 42 until the lumber 50 is gripped between the positioning plate 43 and the rip fence 20, insert the positioning rod 45 into the positioning plate 43 again and rotate the handle 451 for about 180° toward the rip fence 30 such that the positioning plate is fixed as discussed in the above process (as shown Figs. 9, 10 and 11). Since the lumber 50 is tightly gripped between the rip fence 20 and the positioning plate 43, a hacksaw 70 is adopted to cut the lumber 50 through a pair of the desired corresponding oblique vertical slots 21 and 31 (as shown in Figs. 12 and 13).

The improved lumber positioning device of the present invention is characterized in the positioning plates 43 which is freely sliding in the guide grooves to accommodate the cutting lumber 50 to achieve a non-step positioning action. After the lumber is exactly gripped between the positioning plate 43 and the rip fence 20, rotate the positioning rod for about 180° to have the teeth of the symmetrical expanding plates 44 engaged with the rack of the guide groove 42, the

positioning is being fixed without movement so that the lumber  
50 is completely gripped for cutting with a hacksaw. No matter  
how large or how small is the size of the lumber 50. The  
non-step positioning arrangement omits the problems of  
5 selecting the exact positioning holes and/or repeatedly trying  
to accommodate the lumber 50 as did by the prior art lumber  
cutting bench which proves the novelty of the present  
invention.

Note that the specification relating to the above  
10 embodiment should be construed as an exemplary rather than as  
a limitative of the present invention, with many variations  
and modifications being readily attainable by a person of  
average skill in the art without departing from the spirit or  
scope thereof as defined by the appended claims and their legal  
15 equivalents.

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